


County of Loudoun
Office of Transportation Services
MEMORANDUM

DATE: April 29, 2010

TO: Jane McCarter, Project Manager, Department of Planning

FROM: George Phillips, Senior Transportation Planner 

**SUBJECT: SPEX 2010-0001-Ryan Road Child Care Center
First Referral**

Location: North side of Ryan Road (Route 772), east of Belmont Ridge Road (Route 659)
(*Attachment 1*)

Background

The subject application seeks special exception approval on a two-acre site to permit a 9,600 square-foot child care center in the R-1 zoning district pursuant to Zoning Ordinance Section 3-103 (V). Access to the child care facility is proposed via a new entrance onto Ryan Road (Route 772) opposite Legacy Park Drive.

Office of Transportation Services (OTS) review of this special exception application is based on materials received from the Department of Planning on March 9, 2010, including: (1) a statement of justification prepared by the Applicant (Van Metre Communities, L.L.C.); (2) a plan set for SPEX 2010-0001 (including the existing conditions map and special exception plat) prepared by J2 Engineers, Inc., revised through March 4, 2010; and (3) a traffic study prepared by Wells & Associates, dated January 8, 2010.

Existing, Planned and Programmed Transportation Facilities

According to the Revised General Plan, the site is located within the Suburban Policy Area (Ashburn Community). Major roadways serving the site are described below. OTS' review of existing and planned transportation facilities is based on the 2001 Revised Countywide Transportation Plan (2001 Revised CTP) and the 2003 Bicycle & Pedestrian Mobility Master Plan (2003 Bike & Ped Plan).

Ryan Road (Route 772) - Is an important east-west major collector road in Loudoun County connecting Evergreen Mills Road (Route 621) and the Loudoun County Parkway (Route 607). The site proposes direct access to Ryan Road (Route 772) opposite Legacy Park Drive at an existing median break. East of Northstar Boulevard (Route 659 Relocated), Ryan Road is a four-

lane, median divided (U4M) roadway which includes a posted speed limit of 45 mph and separate right and left-turn lanes at a signalized intersection with Belmont Ridge Road (Route 659). In addition, separate right- and left-turn lanes are in place on Ryan Road (Route 772) onto southbound Legacy Park Drive. A separate northbound left-turn lane has already been constructed on Ryan Road (Route 772) into the proposed future site entrance opposite Legacy Park Drive. Based on the latest (2008) traffic count data from VDOT, the segment of Ryan Road (Route 772) in the vicinity of the site carries 4,200 daily vehicle trips. The 2001 Revised CTP calls for Ryan Road (Route 772) to be a six-lane divided (U6M) major collector facility within 120 feet of right-of-way. It is to include right and left-turn lanes at all intersections with a 50-mph design speed. Bicycle accommodations are also to be considered in the design and may require additional right-of-way.

The 2003 Bike & Ped Plan categorizes Ryan Road (Route 772) as a “baseline connecting roadway” along which bicycle and pedestrian facilities are envisioned. There are currently no sidewalks or other pedestrian facilities along the north side of Ryan Road (Route 772) adjacent to the proposed site entrance. However, a paved multi-purpose trail is in place along the south side of Ryan Road (Route 772) opposite the site.

Belmont Ridge Road (Route 659) - Is an important north-south road in Loudoun County intersecting with Route 7, the Dulles Greenway (Route 267) and John Mosby Highway (Route 50). Located approximately 500 feet west of the site, it is a paved four-lane, roadway that includes a posted speed limit of 45-mph and separate right- and left-turn lanes at a signalized intersection with Ryan Road (Route 772). Between Northstar Boulevard (Route 659 Relocated) and Ryan Road (Route 772), Belmont Ridge Road (Route 659) is a four-lane undivided (U4) facility. The segment between Ryan Road (Route 772) south to beyond Creighton Road (Route 774) is constructed as a four-lane divided (U4M) facility. From this point it transitions into a two-lane road south to Evergreen Mills Road (Route 621). Based on the latest (2008) traffic count data from VDOT, the segment of Belmont Ridge Road (Route 659) north of Ryan Road (Route 772) carries 9,900 daily vehicle trips. The segment of Belmont Ridge Road (Route 659) between Ryan Road (Route 772) and Evergreen Mills Road (Route 621) carries 11,000 daily vehicle trips. Between Northstar Boulevard (Route 659 Relocated) and Evergreen Mills Road (Route 621), the 2001 Revised CTP calls for Belmont Ridge Road (Route 659) to be a four-lane divided (U4M) minor collector facility within 120 feet of right-of-way. It is to include right-and left-turn lanes at all intersections with a 40-mph design speed. Bicycle accommodations are also to be considered in the design and may require additional right-of-way.

The 2003 Bike & Ped Plan categorizes Belmont Ridge Road (Route 659) as a “baseline connecting roadway” along which bicycle and pedestrian facilities are envisioned. There are currently pedestrian facilities along portions of both the east and west sides of Route 659 in the vicinity of Ryan Road (Route 772).

Legacy Park Drive - Intersects Ryan Road (Route 772) from the south opposite the proposed site entrance at a median break. It is a two-lane local collector road which serves a portion of the Brambleton Development. It is constructed as a median-divided section from Ryan Road (Route 772) approximately 450 feet south to Stickman Drive where it transitions into a two-lane

facility. It has not yet been accepted into the Secondary Road system. Therefore VDOT traffic count data is not available for this road. However, based on peak hour data from the Applicant's traffic study, it is estimated that this road segment carries approximately 4,000 daily vehicle trips. As a local road, Legacy Park Drive is not included in the 2001 Revised CTP network.

Review of Applicant's Traffic Study

The Applicant's submitted traffic study documents existing, background and total future conditions for the proposed day care facility. It includes review of the Belmont Ridge Road (Route 659)/Ryan Road (Route 772) and Ryan Road (Route 772)/Legacy Park Drive/Future Site Driveway intersections. The study assumed site buildout in a single phase in 2015. OTS staff review of this document is as follows:

Existing Traffic Volumes and Level-of-Service (LOS)

The existing traffic volumes and LOS are shown in *Attachment 2* (Figure 3) and *Attachment 3* (Table 1). The daily traffic and peak hour traffic volumes provided indicate that the intersections shown are operating at an acceptable LOS (C or better).

Background (Year 2015) Traffic Volumes and Level-of-Service (LOS)

The background traffic volumes and LOS (without development of the subject child care center but including the 19 single family detached units assumed in the adjacent by-right Ryan Road subdivision plus other nearby developments), are shown in *Attachment 4* (Figure 6). The traffic study adjusted the background traffic volumes to reflect the completion of the Loudoun County Parkway between its current terminus south of Ryan Road (Route 772) and Old Ox Road (Route 606). As a result of this anticipated connection which is proffered by the Brambleton development, half of the westbound left turns and northbound right turns were assumed to utilize the Loudoun County Parkway rather than Belmont Ridge Road (Route 659). These adjustments are shown in *Attachment 5* (Figure 5). The daily traffic and peak hour traffic volumes provided in *Attachment 4* (Figure 6) indicate that the signalized Ryan Road (Route 772)/Belmont Ridge Road (Route 659) intersection will operate at an acceptable (overall LOS C) during both peak hours. Three (eastbound, westbound and northbound) of the four approaches at the stop sign controlled Site Driveway/Legacy Park Drive/Ryan Road (Route 772) intersection are forecasted to operate at an acceptable LOS (LOS B or better) during both peak hours. During the A.M. peak hour, the southbound approach is forecasted to operate at an acceptable LOS (LOS C). However, during the P.M. peak hour, the southbound approach is forecasted to operate at an unacceptable LOS (LOS F).

Trip Generation Information

The Applicant's traffic study (see *Attachment 6* (Table 2)) estimates that the proposed child day care center would generate 157 A.M. peak hour, 143 P.M. peak hour and 941 daily vehicle trips. This information is based on rates and equations (Land Use Code 565) for Child Day Care from the Trip Generation Manual, 8th Edition, Institute of Transportation Engineers (ITE).

The existing zoning for this allowed on this site is R-1 which would allow for two single family dwellings. Based on rates and equations from the *Trip Generation Manual, 8th Edition, (ITE)* the two residential-single family detached units (Land Use Code 210) would generate 2 A.M. peak hour, 2 P.M. peak hour and 20 daily vehicle trips. The proposed use represents an increase of 155 A.M. peak hour, 141 P.M. peak hour and 921 daily vehicle trips over the by-right use.

Trip Distribution

The Applicant's traffic study (see *Attachment 7* (Figure 7)) provides trip distribution information based on forecasted traffic volumes and anticipated home to work travel patterns. A majority of the site traffic is accessing the site from the west on Ryan Road (Route 772) and then exiting to go to the east during the A.M. peak hour. This is reversed during the P.M. peak hour, in which a majority of the site traffic is accessing the site from the east on Ryan Road (Route 772) and then exiting to go to the west during the P.M. peak hour.

Forecasted (Year 2015) Total Future Traffic Volumes and Level-of-Service

The forecasted total future traffic volumes and LOS (assuming background traffic plus site-generated traffic) are shown in *Attachment 8* (Figure 8). The daily traffic and peak hour traffic volumes provided indicate that the signalized Ryan Road (Route 772)/Belmont Ridge Road (Route 659) intersection will operate at an acceptable overall LOS (LOS C) during both peak hours. Three (eastbound, westbound and northbound) of the four approaches at the stop sign controlled Site Driveway/Legacy Park Drive/Ryan Road (Route 772) intersection are forecasted to operate at acceptable LOS (LOS C or better) during both peak hours. However, the southbound approach is forecasted to operate at LOS E during both peak hours.

Traffic Study Conclusions

The Applicant's traffic study sets forth several conclusions as follows:

- All of the approaches and turning movements at the Belmont Ridge Road (VA Route 659)/Ryan Road (VA Route 772) intersection and the Legacy Park Drive/Ryan Road intersection currently operate at acceptable LOS during both A.M. and P.M. peak hours.
- The existing zoning (R-1) for the Ryan Road Property allows for the development of two (2) single-family homes that would generate 2 A.M. peak hour trips, 2 P.M. peak hour trips, and 20 average daily (24-hour) trips. The proposed Ryan Road Property Special Exception program (208-student child care center) would generate 157 A.M. peak hour trips, 143 P.M. peak hour trips, and 941 average daily (24-hour) trips. Thus, the proposed special exception would generate 155 more A.M. peak hour trips, 141 more P.M. peak hour trips, and 921 more daily trips when compared to the current zoning.
- The Belmont Ridge Road (Route 659)/Ryan Road (Route 772) signalized intersection currently operates at overall acceptable LOS during both the A.M. and P.M. peak hours, and is

expected to continue to do so in 2015 with or without the proposed special exception without further improvements.

-All of the movements at the Belmont Ridge (Route 659) and Legacy Park Drive/Site Entrance on Ryan Road (Route 772) are anticipated to operate at acceptable LOS with the special exception, with the exception of the southbound approach of the Site Driveway. This approach would theoretically operate beyond capacity during the A.M. and /or P.M. peak hours under both background and future conditions. Warrants for signalization would not be met under either condition at this location. In addition, gaps in through traffic created by the traffic signal at Belmont Ridge Road (Route 659), the wide median on Ryan Road (Route 772) and separate lanes for southbound traffic exiting the Site Driveway are expected to facilitate these movements and minimize delay for motorists.

-Under total future conditions, the traffic study states indicate that the additional traffic generated by the proposed special exception would have minimal impact to the road network and intersection delays, and not require any additional road improvements beyond a separate westbound right-turn lane on Road (Route 772) in accordance with the Countywide Transportation Plan. The existing eastbound left-turn lane on Ryan Road (Route 772) (approximately 350 feet of storage) would adequately serve the site.

Transportation Comments

1. The Applicant's traffic study notes on page 6 that Ryan Road (Route 772) includes a crest / vertical curve in the vicinity of the proposed site entrance opposite Legacy Park Drive. This has been confirmed by OTS staff in a recent field visit. The Applicant will need to demonstrate that adequate sight distance is provided to meet VDOT standards. This should be confirmed with VDOT.
2. The unsignalized Ryan Road (Route 772)/Legacy Park Drive intersection is currently operating at LOS C or better during both peak hours. However, the Applicant's traffic study also shows that with the addition of the site entrance, the southbound approach from the site to Ryan Road would operate at LOS E during both peak hours, assuming the addition of a separate southbound right turn lane (see **Attachment 8**). A condition of approval requiring installation of this turn lane is necessary. Further, the traffic study notes that enough gaps in through traffic flow will be created by the traffic signal at Belmont Ridge Road (Route 659) combined with the wide median on Ryan Road (Route 772) for storage and separate lanes for southbound traffic. Additional information, demonstrated by a traffic study addendum or other analysis, is required to substantiate this assertion. Any additional analysis should examine the possibility of a signal at this intersection and the signal's relationship with the existing signal at Belmont Ridge Road (Route 659) and Ryan Road (Route 772).
3. The Applicant's traffic study notes on page 20, Conclusion #5, that a separate westbound right-turn lane on Ryan Road (Route 772) is needed into the proposed site entrance. This needs to be included in the conditions of approval with this application.

4. Please note that the centerline of the site entrance approach to Ryan Road (Route 772) does not appear to properly align with the existing median break for Legacy Park Drive. The proposed roadway alignment must meet VDOT standards; confirmation by VDOT is necessary.
5. Interparcel access is recommended in order to reduce trip lengths and minimize impact on Ryan Road, a major collector facility. However, the opportunity for interparcel access may be limited for this particular site and the surrounding subdivision (SBPL-2010-0001) given the existing and approved developments on all surrounding parcels. Please confirm.
6. On Sheet 3 of the Plat, a 10' wide public access easement is shown along the site frontage. In order to facilitate pedestrian travel, it is recommended that the Applicant provide a 14' wide public access easement and a 10-foot wide trail along the site frontage along with a crosswalk across the site entrance. Subject to VDOT approval, the Applicant should also provide a crosswalk and signage to connect to the existing trail on the south side of Ryan Road (Route 772).

Conclusion

OTS will offer a recommendation once it has reviewed the Applicant's responses to these comments. OTS staff is available to meet with the Applicant for further discussion of this proposal.

ATTACHMENTS

1. Site Vicinity Map / Site Layout Map
2. Existing Traffic and LOS (Figure 3)
3. Existing Traffic and LOS (Table 1)
4. Background Traffic and LOS Without Development (Figure 6)
5. Other Development Traffic Assignments, Regional Growth and Existing Traffic Diversions (Figure 5).
6. Trip Generation Information (Table 2)
7. Trip Distribution Information (Figure 7)
8. Total Future Forecasted Traffic and LOS (Figure 8)

cc: Andrew Beacher, Assistant Director, OTS
Lou Mosurak, Senior Coordinator, OTS



Figure 1
Site Location Map

Study Intersection



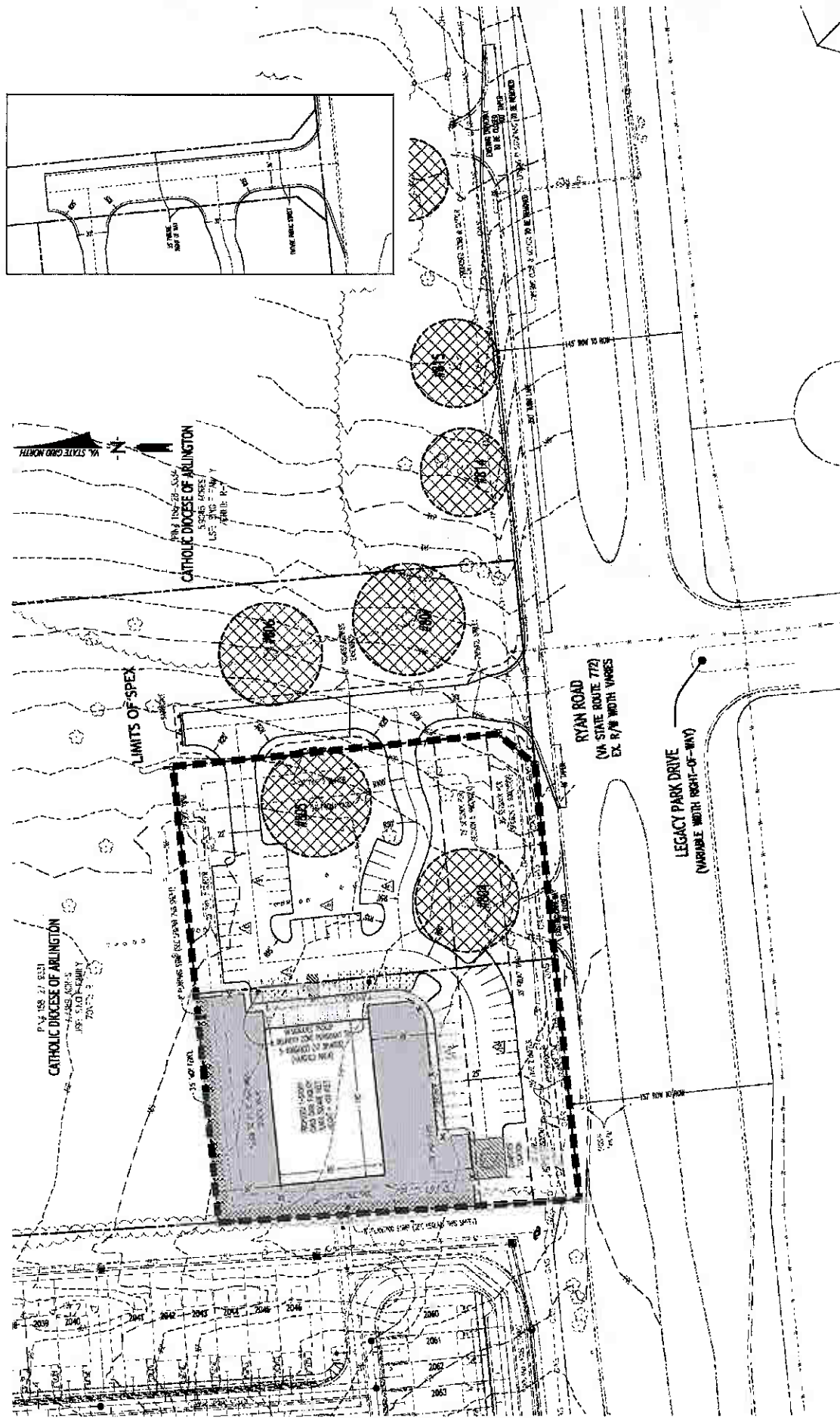


Figure 2
Site Development Plan
(Provided by J2 Engineers)

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North

Table I
Ryan Road Property
Intersection Level of Service

Intersection	Intersection Control	Critical Movement	Existing 2008		2015 Background		2015 Total Future	
			AM	PM	AM	PM	AM	PM
1. Belmont Ridge Road (Route 659)/ Ryan Road (Route 772)	Signalized	EBL	B (19.2)	B (18.2)	B (17.7)	C (21.4)	B (18.0)	C (21.6)
		EBT	C (30.4)	C (25.2)	C (30.2)	C (28.9)	C (30.8)	C (29.1)
		EBR	C (24.6)	C (23.8)	C (22.9)	C (26.4)	C (23.1)	C (26.5)
		WBL	B (17.0)	B (17.3)	B (17.2)	B (18.9)	B (17.6)	B (19.6)
		WBT	C (22.6)	C (22.5)	C (22.6)	C (28.7)	C (22.7)	C (29.2)
		WBR	C (22.9)	B (18.6)	C (22.3)	C (22.0)	C (22.4)	C (22.0)
		NBL	C (23.0)	C (20.2)	C (24.9)	C (22.6)	C (25.5)	C (23.0)
		NBT	C (30.1)	C (27.8)	C (34.5)	C (33.3)	D (35.2)	C (33.8)
		NBR	C (31.3)	C (25.1)	C (32.2)	C (28.5)	C (33.4)	C (28.9)
		SBL	B (16.9)	B (17.4)	C (20.1)	B (18.8)	C (21.0)	B (19.1)
		SBT	C (22.5)	C (23.8)	C (26.6)	C (26.5)	C (27.1)	C (26.8)
		SBR	<u>C (21.2)</u>	<u>C (22.4)</u>	<u>C (24.5)</u>	<u>C (24.2)</u>	<u>C (25.0)</u>	<u>C (24.5)</u>
		Overall	C (25.9)	C (22.4)	C (27.0)	C (26.9)	C (27.6)	C (27.3)
2. Ryan Road (Route 772)/ Legacy Park Drive/Future Site Driveway	Unsignalized	WBL	B [11.6]	A [9.4]	N/A		N/A	
		NBL	C [17.6]	C [15.3]				
		EBL	N/A		A [8.9]	B [12.0]	A [9.2]	B [12.5]
		WBL			B [11.9]	A [9.8]	B [11.9]	A [10.0]
		NBLT			B [13.8]	B [12.4]	B [14.5]	C [15.3]
		NBR			A [0.0]	A [0.0]	A [0.0]	A [0.0]
		SBLTR			C [19.8]	F [52.3]	N/A	N/A
		SBLT			N/A	N/A	E [36.1]	E [35.2]
		SBR			N/A	N/A	A [0.0]	A [0.0]

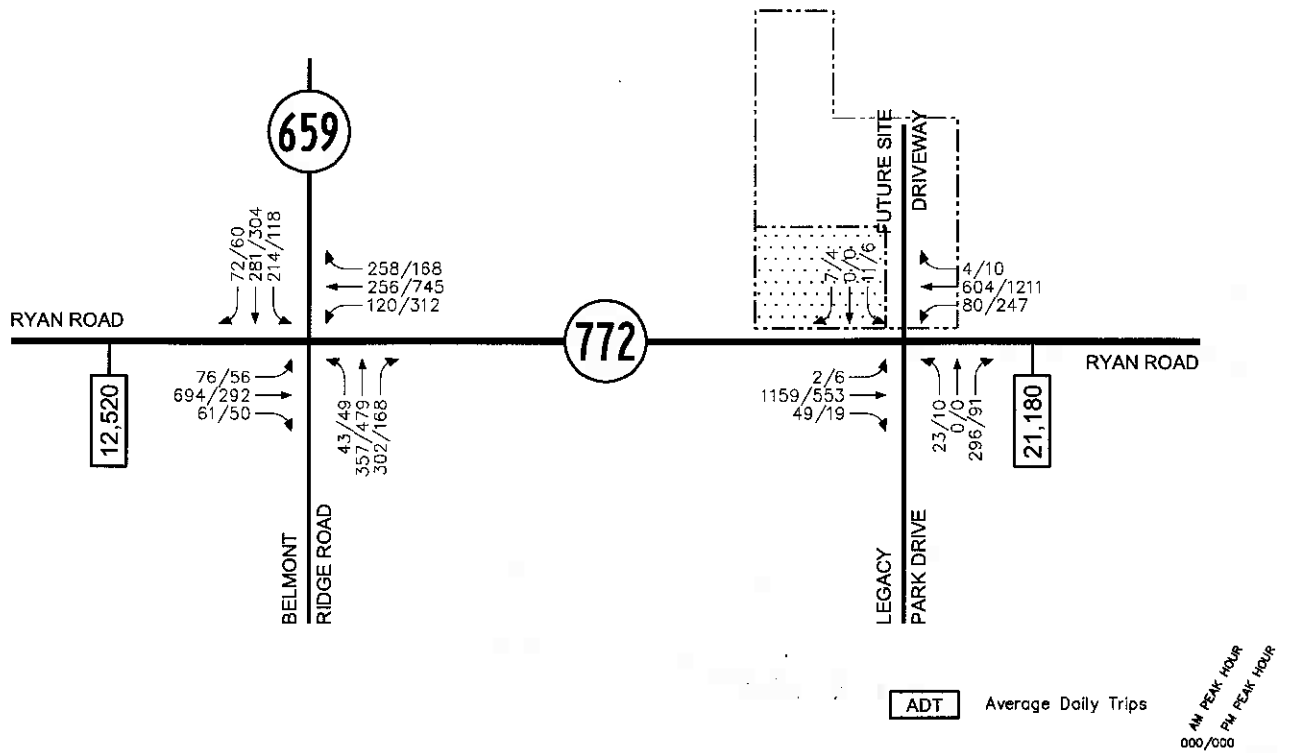
Notes:

Numbers in parentheses () represent delay at signalized intersections in seconds per vehicle.

Numbers in square brackets [] represent delay at unsignalized intersections in seconds per vehicle.

Synchro files and timings provided by VDOT and remain constant through all analysis scenarios.

Background Future Traffic Forecasts



Background Future Levels of Service

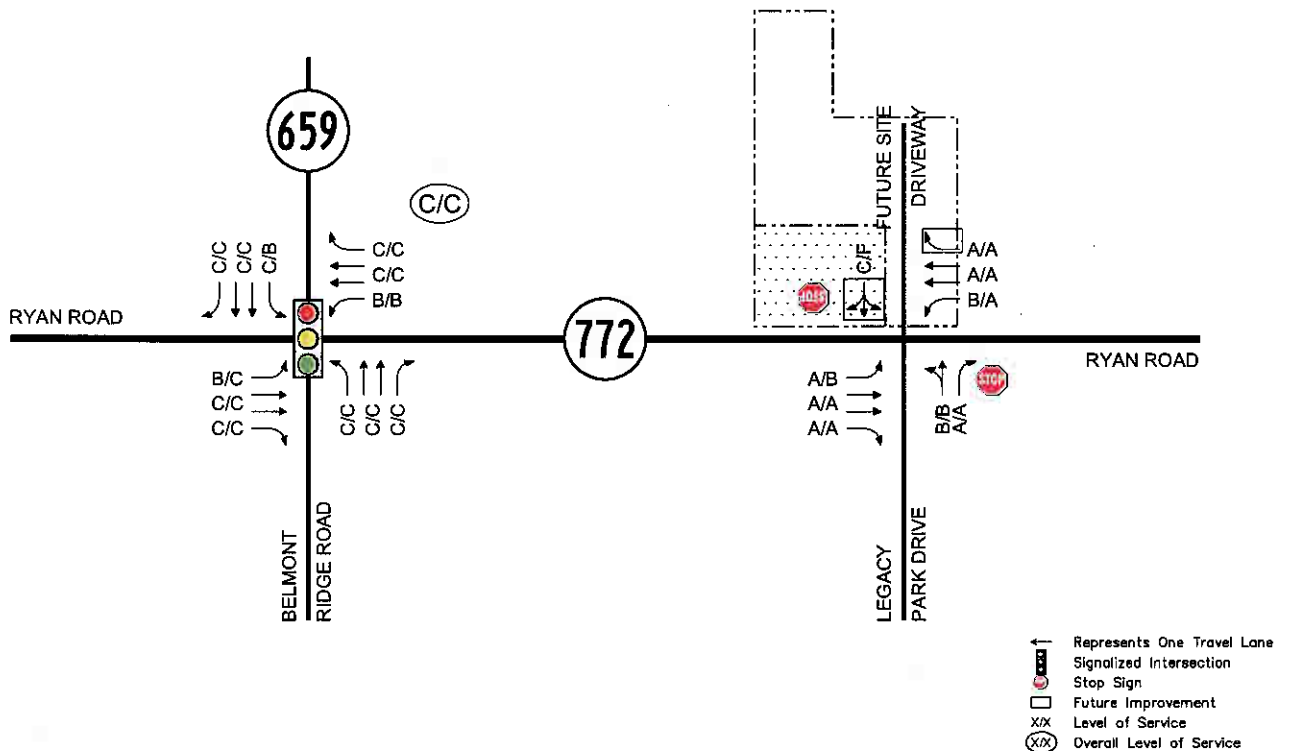
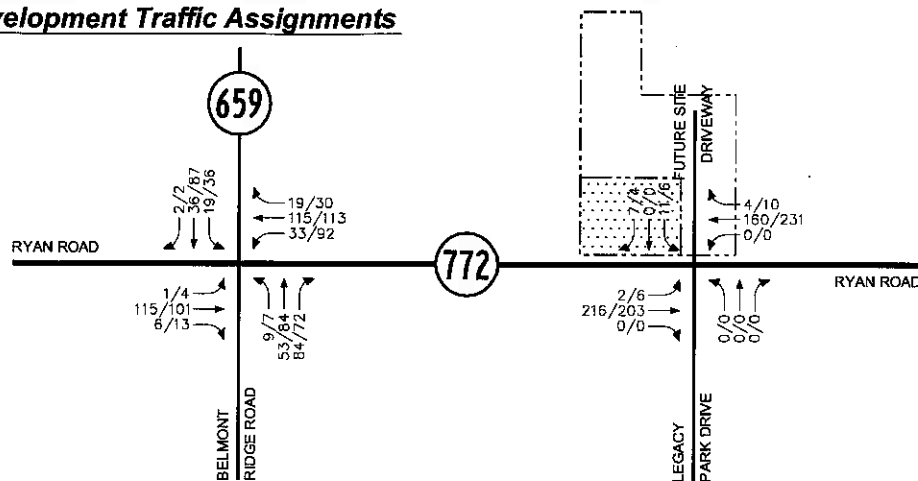


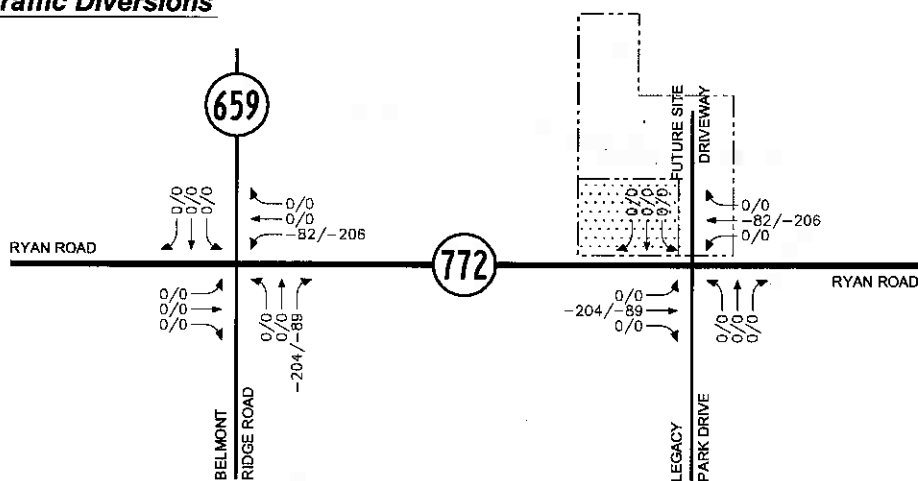
Figure 6
Background Future Peak Hour Traffic Forecasts and
Levels of Service



2015 Other Development Traffic Assignments



2015 Existing Traffic Diversions



2015 Regional Growth (1% Compounded Annually)

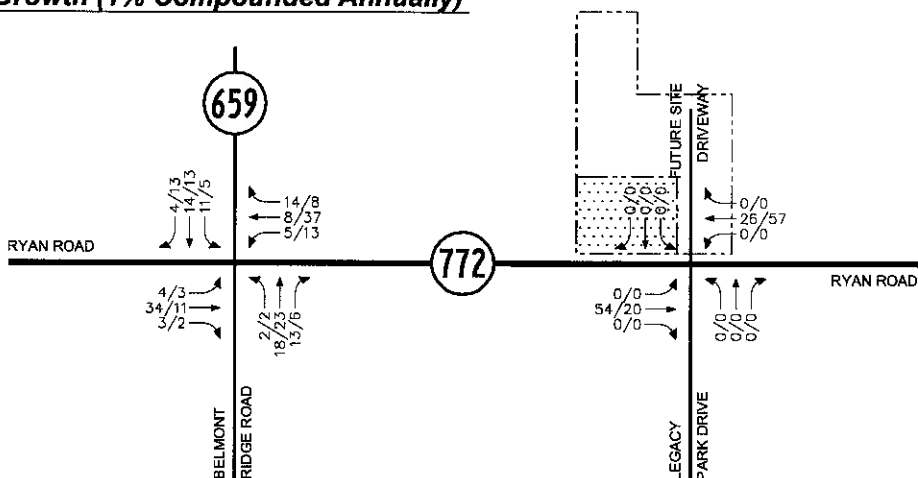


Figure 5
Other Development Traffic Assignments, Regional Growth
and Existing Traffic Diversions

AM PEAK HOUR
PM PEAK HOUR
000/000



Table 2

Ryan Road Property

Site Trip Generation Summary (1)

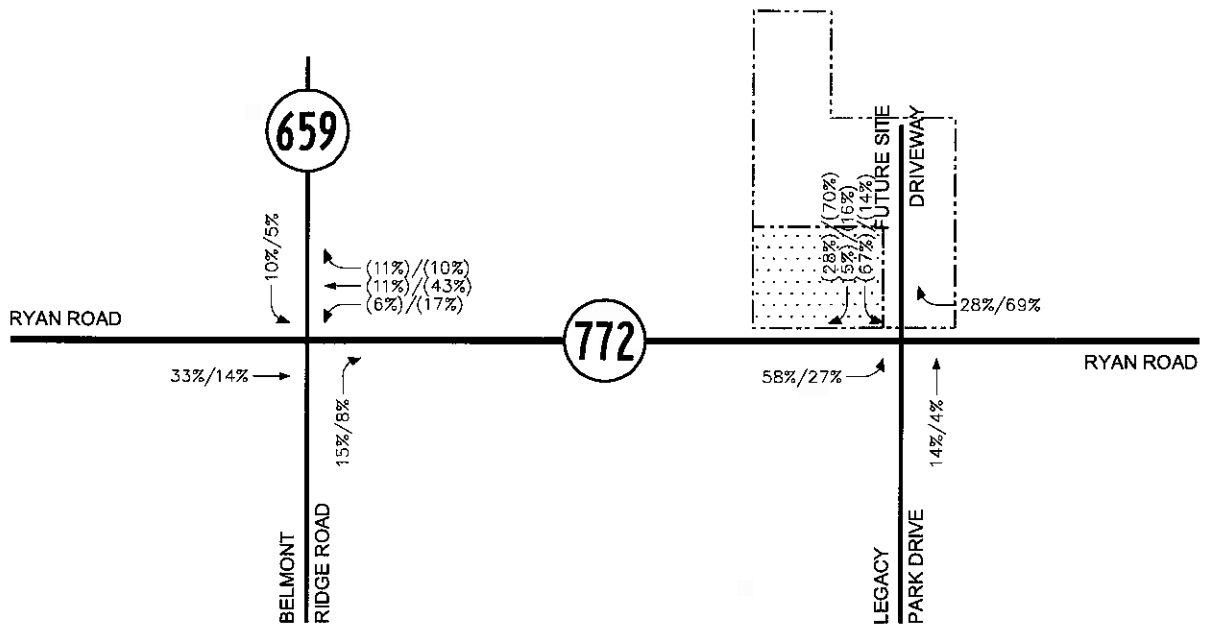
Development/Use	Land Use			AM Peak Hour (2)			PM Peak Hour			Weekday ADT (3)
	Code	Amount	Units	In	Out	Total	In	Out	Total	
Existing Zoning										
Residential - Single-Family Detached	210	2	DU	1	1	2	1	1	2	20
Proposed Special Exception										
Child Day Care Center	565	208	Students	83	74	157	67	76	143	941
Difference (Net New Trips)				82	73	155	66	75	141	921

Notes: (1) Trips based on the rates and equations published in the Trip Generation Manual, 8th Edition, by the Institute of Transportation Engineers (ITE).

(2) Based on average rate due to small size.

(3) ADT based on 10 daily trips per residential unit.

Directional Distributions



Site-Generated Traffic Assignments (Net New Trips)

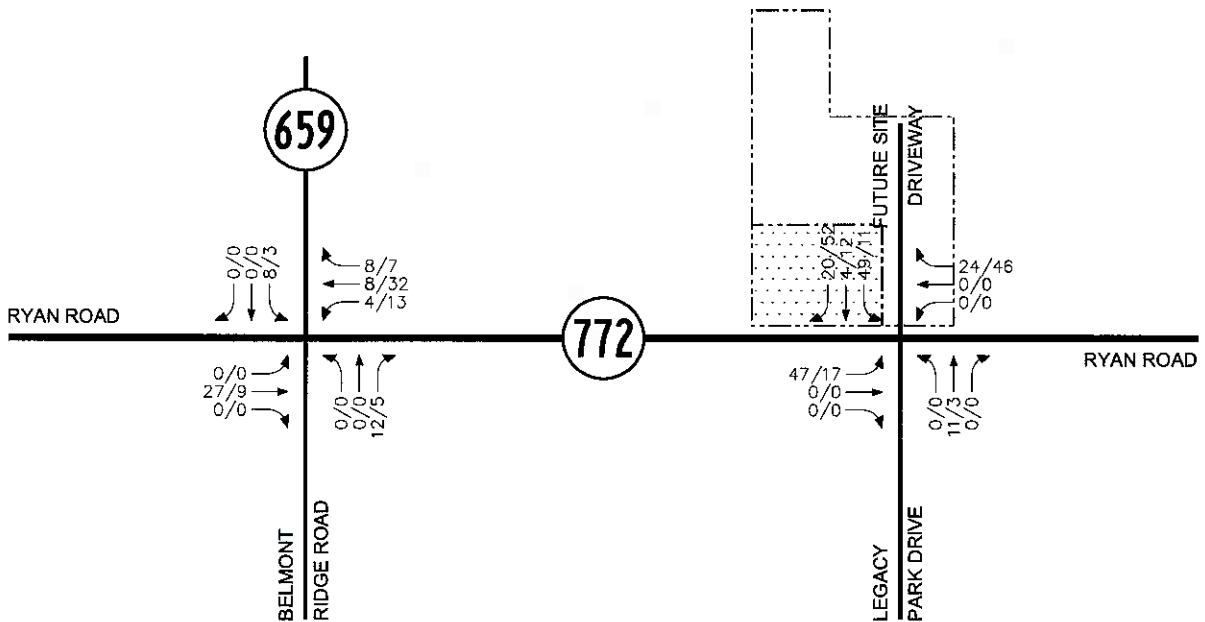


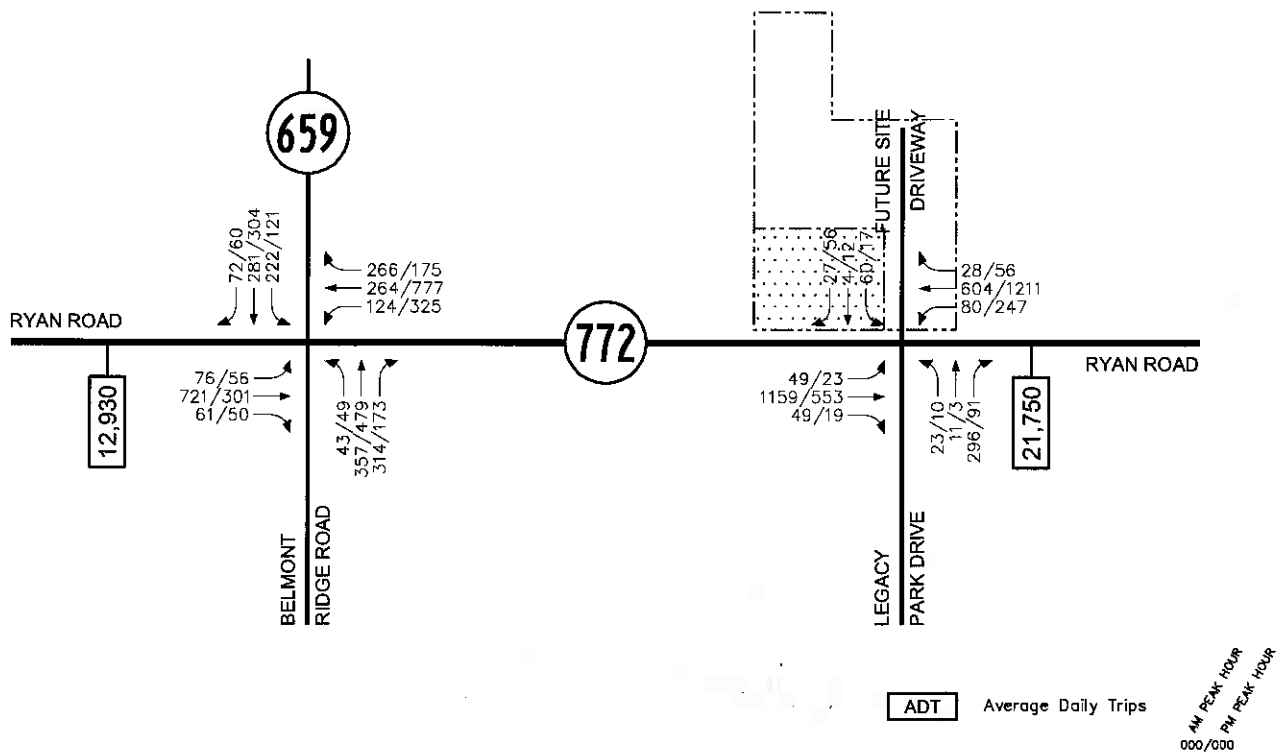
Figure 7
Site-Generated Traffic Assignments and
Directional Distributions

00% IN
(00%) OUT

AM PEAK HOUR
PM PEAK HOUR
000/000



Total Future Traffic Forecasts



Total Future Levels of Service

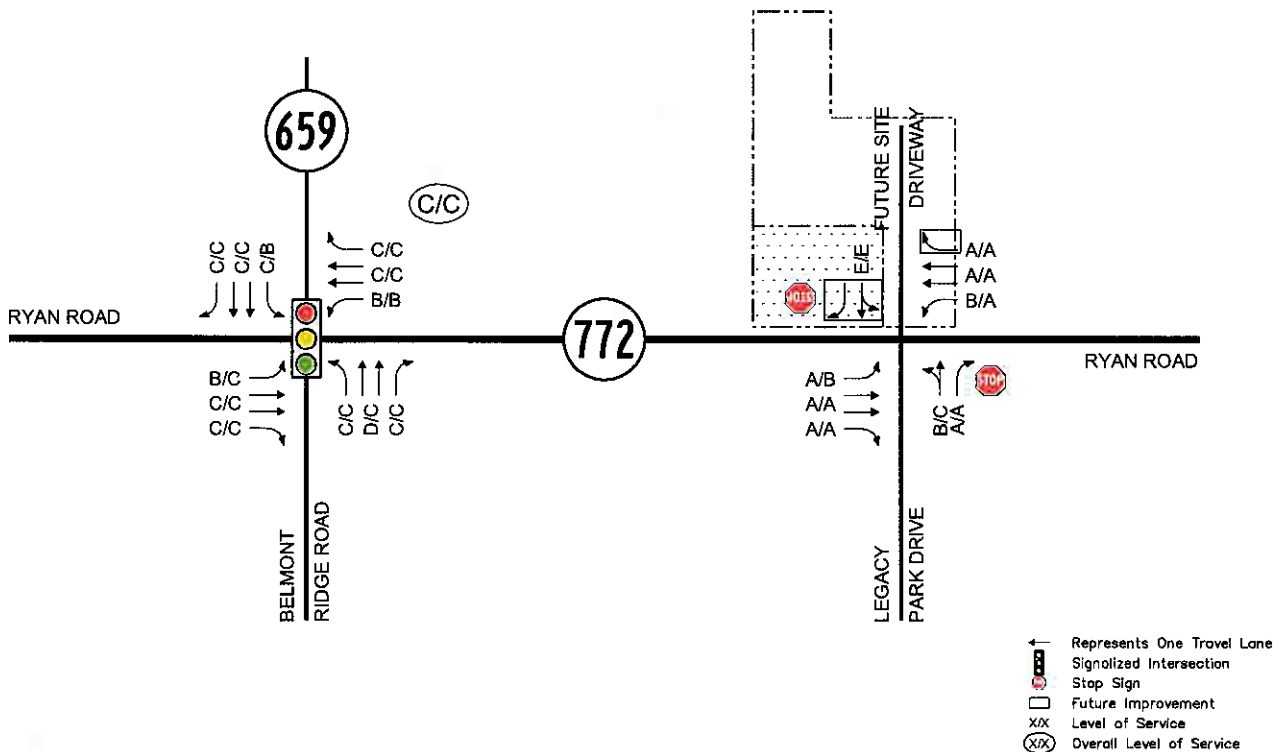


Figure 8
 Total Future Peak Hour Traffic Forecasts and
 Levels of Service

